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Canadian Environmental Sustainability Indicators

Status of wild species

Canada

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Canadian Environmental Sustainability Indicators

Status of wild species

May 2018

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Status of wild species

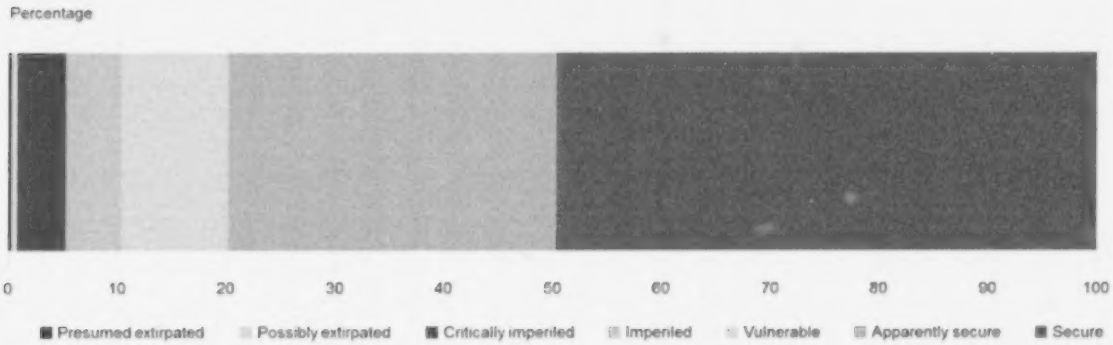
Canada supports a remarkable diversity of life. About 80 000 species are known to exist in Canada, excluding bacteria and viruses. However, wild species face a variety of threats, including the loss, fragmentation and degradation of habitat; pollution; overexploitation; and fishery bycatch and other incidental loss due to resource harvesting. These indicators summarize the risk of species loss.

Key results

The Wild Species 2015 report assessed the conservation status of 29 848 species in 34 species groups. 16 078 native species were assigned a national extinction risk level.

- 80% or 12 833 species are ranked as secure or apparently secure.
- 10% or 1 586 species are vulnerable.
- 10% or 1 534 species are imperiled or critically imperiled.
- Less than 1% or 125 species are presumed extirpated or possibly extirpated (no longer found in Canada).

Figure 1. National conservation status of native wild species, Canada, 2015



Data for Figure 1

Note: The ranking system developed by NatureServe, an international network of over 80 conservation data centers, is used.
Source: Canadian Endangered Species Conservation Council (2016) Wild Species 2015: The General Status of Species in Canada, National General Status Working Group.

The status of wild species has been assessed every 5 years since 2000. Between 2000 and 2015, the proportion of species ranked as secure varied between 70% and 80%. This variation is due mainly to the assessment of additional species.

Most of the 8 145 species that could be examined for changes in national extinction risk level between 2010 and 2015 did not change. Of those that did change, 9 had genuine improvements in status, while the status of 21 deteriorated due to changes in population size, distribution, or threats to the species. Some species have changed status because information has improved, or because there have been procedural or taxonomic changes.

Species with genuine status changes between 2010 and 2015

Species with improved risk level:

- Bowhead Whale (Balaena mysticetus)
- Black-necked Stilt (Himantopus mexicanus)
- American White Pelican (Pelecanus erythrorhynchos)

- Striped bass (Morone saxatilis)[1]
- Wild Indigo Duskywing (Erynnis baptisiae)
- Giant Swallowtail (Papilio cresphontes)
- Little Glassywing (Pompeius verna)
- Olympic Onion (Allium crenulatum)
- Wedgescale Saltbush (Atriplex truncata)

Species with deteriorating risk level:

- Western Small-footed Myotis (Myotis ciliolabrum)
- Little Brown Myotis (Myotis lucifugus)
- Northern Long-eared Myotis (Myotis septentrionalis)
- Muskox (Ovibos moschatus)
- Tri-colored Bat (Perimyotis subflavus)
- Purple Sandpiper (Calidris maritima)
- Laughing Gull (Leucophaeus atricilla)
- Hudsonian Godwit (Limosa haemastica)
- Great Cormorant (Phalacrocorax carbo)
- Atlantic Mackerel (Scomber scombrus)[1]
- Aholibah Underwing (Catocala aholibah)
- Early Hairstreak (Erora laeta)
- Propertius Duskywing (Erynnis propertius)
- Seashore False Bindweed (Calystegia soldanella)
- Angled Bittercress (Cardamine angulata)
- One-flowered Bleeding-heart (Dicentra uniflora)
- Common Downingia (Downingia elegans)
- Brook Spike-primrose (Epilobium torreyi)
- American Silvertop (Glehnia littoralis)
- Rayless Goldfields (Lasthenia glaberrima)
- Seaside Goldfields (Lasthenia maritima)

The first step in conserving our wild species is finding out which ones we have. Once we have a list of known species, we can examine each of them to determine how likely it is that it will disappear from Canada. If necessary, we can take steps to conserve species that are at risk.

The known species in Canada are divided among 5 different kingdoms: protozoa (about 1% of the known species, excluding viruses and bacteria), chromists (about 4%), fungi (about 16%), plants (about 11%), and animals (about 68%). Almost half the known species are insects. The Wild Species report considers all species larger than microbes, which includes most fungi, plants and animals. Although more animal species have been assessed, a higher proportion of plant species have been assessed (74% versus 42% of animal species).

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[1] Fish species were not assessed in 2010. Changes in rank for fish species are between 2005 and 2015.

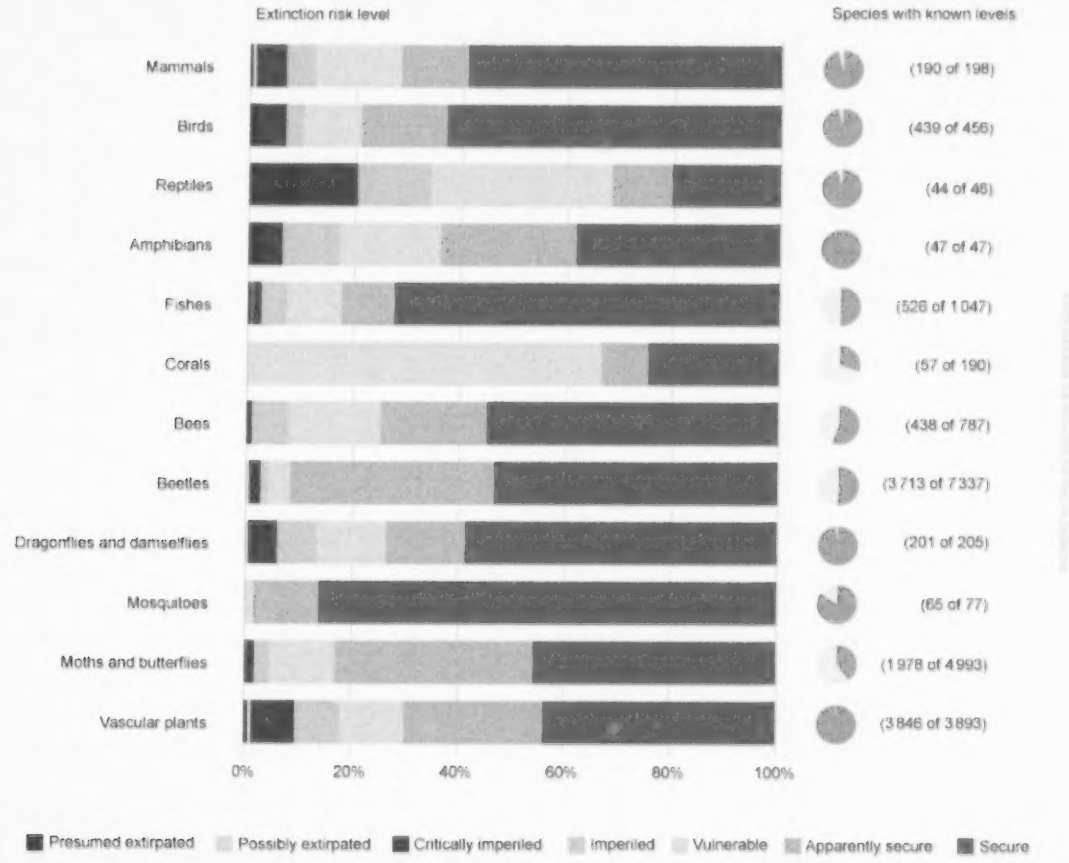
Status of selected groups of wild species

Key results

Not all groups of species face the same level of threat. Amongst native species[2] with assigned risk levels:

- About 28% (54 of 190) of mammal species and 21% (92 of 439) of bird species are at risk of disappearance.
- Reptiles are one of the groups most at risk, with 68% (30 of 44) of species at risk.
- The vascular plant group has the largest number of species at risk, with 1 157 species. This is about 30% of the 3 846 ranked species in this large group.

Figure 2. Status of native species in selected groups, Canada, 2015



Data for Figure 2

Note: Twelve (12) of the 34 groups considered in the Wild Species 2015 report are presented in the figure, while all 34 groups are listed in the data table. The pie charts indicate the proportion of species with known levels; levels for Unrankable and Not

[2] Species assessed as Not applicable are not included.

ranked species are unknown. Species with a status of Not applicable are excluded.
Source: Canadian Endangered Species Conservation Council (2016) Wild Species 2015: The General Status of Species in Canada, National General Status Working Group.

Two (2) species groups that contain familiar pollinators are bees (25% at risk of extinction) and moths and butterflies (17% at risk). Both groups have many species that cannot be ranked due to a lack of information.

Similar to reptiles, corals also have many at-risk species, but the status of coral species is not well known.

Beetles, with over 7 000 known species, are the largest group considered so far. Vertebrates (animals with backbones), the species we think of most often when we think of wildlife, have only 2 376 known species and make up less than 3% of Canadian species. Most of the vertebrates are fish.

Several large groups of organisms have not yet been assessed, including many fungi, certain insects, and seaweeds. These less-familiar organisms perform critical roles in maintaining the healthy functioning of ecosystems on which all organisms, including humans, depend for water and air purification, crop pollination, soil formation and many other services.

The most common threat to species is loss of habitat. Humans have altered habitat on land and in freshwater and the oceans, affecting all assessed species groups. Physical changes to habitat are common, but other human-mediated changes have had widespread impact. For example, pollution, climate change and invasive species affect many groups.

Some groups also face more specific threats. For example, some species of vascular plants, mammals and fish are threatened by overharvesting. Corals are threatened by ocean acidification and mechanical damage, such as that caused by fishing gear.

The most at-risk groups face a combination of threats. For example, threats to reptiles include habitat fragmentation and destruction, road kill, collection as pets, predators, pollution, invasive species, disease, and persecution. Sea turtles are also threatened by egg harvesting, loss and alteration of nesting beaches, consumption of garbage mistaken for prey, and injury from fishing equipment.

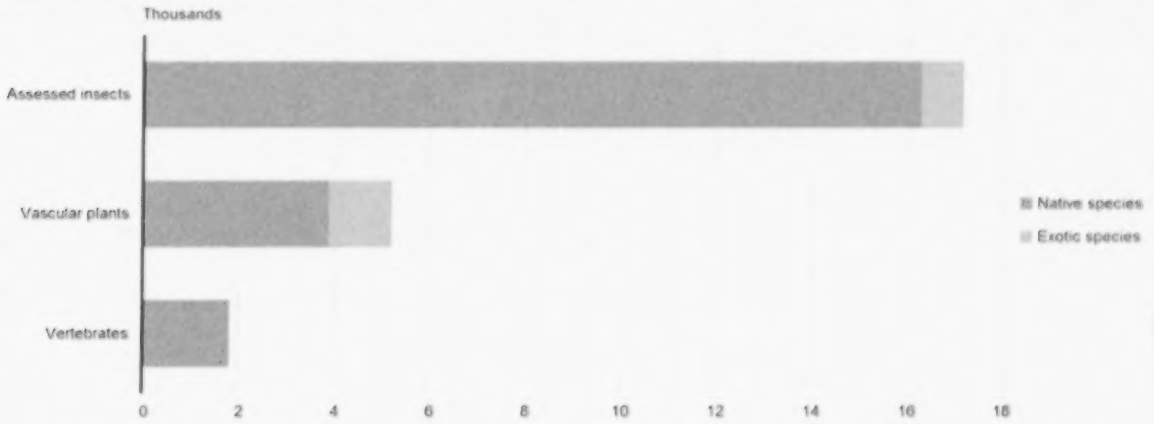
Exotic species

The species present in Canada include exotic species, which have been moved beyond their natural range by human actions. Some exotic species may become invasive, spreading and displacing native species or causing other damage to ecosystems. This indicator shows the proportion of exotic species to native species.

Key results

- The vascular plants group has the highest proportion of exotic species (25%, 1 315 of 5 211 species) among the groups assessed.
- 39 vertebrate species, or about 2%, are exotic.

Figure 3. Native and exotic species in selected groups, Canada, 2015



Data for Figure 3

Note: Native and exotic species (24 234 species) are considered. Other species that are not subject to conservation efforts, such as hybrids and species that occur only occasionally in Canada, are excluded. All species of vascular plants and vertebrates have been assessed but not all insects.
Source: Canadian Endangered Species Conservation Council (2016) Wild Species 2015: The General Status of Species in Canada, National General Status Working Group.

Exotic species arrive in Canada through many different pathways. Ornamental garden plants, live food, and species for display in terrariums and aquariums are all examples of organisms that are deliberately brought in. They are considered established if they escape human control and persist in unmanaged populations. Deliberately imported species may be accompanied by weed seeds and species that are unintentionally present in soil or aquarium water. These species may also escape. Organisms may also be accidentally transported in other ways, for example in ship ballast water, in packing materials like pallets, or in the mud under car fenders.

Not all species that are transported to Canada escape and establish persistent populations. Of those that do, some begin to spread and cause damage to ecosystems. Exotic species that become damaging are termed invasive. Invasive species threaten native species in a number of ways. For example, they can use up space or other resources, or they may prey upon or cause disease in native species.

Exotic species were identified as part of an effort to assess the conservation status of wild species in Canada. Exotic species are present in Canada, but they are not subject to conservation efforts and are not assigned a national extinction risk level.

About the indicators

What the indicators measure

The main indicator summarizes the risk of extinction for individual species in Canada. A species is defined as a population of organisms that does not usually interbreed with other populations, even where they overlap in space and time.[3] Extinction risks vary across groups, as does the state of knowledge. Non-native species tend to occur more often in some groups than in others.

The indicators use data from Wild Species 2015. Every 5 years, a Wild Species report by the Canadian Endangered Species Conservation Council provides information on a large number of Canadian wild species to assess the general status of species and species groups. This information can reveal early signs of trouble before species reach a critical condition. The reports also identify gaps in our knowledge of wild species.

Why these indicators are important

The indicators provide a measure of extinction risk and an indication of the overall state of biodiversity in Canada, since the loss of a species is a loss of biodiversity. The leading cause of biodiversity loss in Canada and around the world is the loss of habitat to human development. Direct threats such as habitat loss and overharvest can be mitigated through actions such as habitat protection and harvest regulation. Wild species also face the indirect effects of human activities, including invasive species, new diseases, and climate change. Exotic species can become invasive and alter how ecosystems function.

Related indicators

Changes in the status of species at risk tracks changes in the level of risk for species assessed by the Committee on the Status of Endangered Wildlife in Canada, using different categories than used here.

Species at risk population trends provides an assessment of the recovery trends of species at risk listed under the Species at Risk Act.

Population status of Canada's migratory birds and Trends in Canada's migratory bird populations provide a snapshot assessment of the state of Canada birds and population trends for birds.

Invasive alien species in Canada provides information on the subset of exotic species that become invasive.

Healthy wildlife populations

These indicators support the measurement of progress towards the following 2016–2019 Federal Sustainable Development Strategy long-term goal: All species have healthy and viable populations.

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[3] Canadian Endangered Species Conservation Council (2011) Wild Species 2010: The General Status of Species in Canada. National General Status Working Group. Retrieved on April 30, 2018.

Data sources and methods

Data sources

Data for the indicators are drawn from the Wild Species 2015 report. The Wild Species report provides an assessment of the general status of Canadian species in all provinces, territories and ocean regions, as well as at the national level.

More information

The Canadian Endangered Species Conservation Council assesses the status of wild species every 5 years. The first assessment was done in 2000 for 1 670 species. New species and species groups have been added in each subsequent report. The Wild Species 2015: The General Status of Species in Canada report assessed the conservation status of 29 848 species in 34 species groups occurring in Canada. Of these, 16 078 native species were assigned a national extinction risk level.

Species are assessed throughout Canada at the regional level (see the Methodology section in the Wild Species 2015 report for a list of regions). The regional assessments are used to determine the national assessment.

The Status of wild species indicators consider only the suite of wildlife species assessed in the Wild Species 2015 report. Knowledge of wild species varies among regions and among taxonomic groups. A risk ranking was assigned only to species that have sufficient data to be assessed.

Methods

National extinction risk levels are an assessment of the likelihood that a species will disappear from Canada (become extirpated). Risk levels are based on the rarity of the species, recent trends in population size and distribution, and the threats that are present. The proportion of assessed species in each risk category is reported. Also reported is the proportion of species for which the extinction risk is known versus the total number of known species.[4] Species that are not native to Canada are labelled as exotic and not assessed for extinction risk.

More information

Status assessment

Status assessment is based on the best available knowledge.

1. For each species group, a species list is developed. The list contains the scientific names of the species that are known to occur or to have occurred in Canada.
2. Species are assigned a regional status using the NatureServe Conservation Rank Calculator. There are 18 regions, including 1 for each province and territory of Canada. Newfoundland and Labrador are treated as 2 regions. In addition, there are 4 ocean regions. Data come from a wide variety of sources, including museums, the scientific literature, scientists, indigenous and community knowledge, and government sources. Each species has a status in each region where it occurs.
3. For each species, a national status (Table 1) is derived from the regional statuses using a set of rules that cover most cases. For situations that are not covered by the rules, the national status is assigned using the NatureServe rank calculator.

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[4] Species for which the extinction risk level is unknown include the category Unrankable (NU), which means the species cannot be assessed because of insufficient information and the category Not ranked (NNR), which means the species has not yet been assessed. Species with the designation Not applicable (NNA) are not included in the Status of wild species indicators.

Priority is given to reassessing taxonomic groups that were assessed in previous Wild Species reports. New taxonomic groups to be assessed are selected based on provincial and territorial priorities as well as recommendations from other organizations, including the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the Biological Survey of Canada, the Canadian Food Inspection Agency, and academia. The selection of taxonomic groups also reflects important conservation issues (for example, the protection of pollinators), existing knowledge and the resources available for assessment.

Table 1. Definition of national conservation status categories

NatureServe code	Status name	Definition
NX	Presumed extirpated	Species is believed to be extirpated from the country. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
NH	Possibly extirpated	Known only from historical records but still some hope of rediscovery. There is evidence that the species may no longer be present in the country, but not enough to state this with certainty.
N1	Critically imperiled	At very high risk of national extirpation due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.
N2	Imperiled	At high risk of extirpation due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
N3	Vulnerable	At moderate risk of extirpation due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
N4	Apparently secure	At a fairly low risk of extirpation due to an extensive range and/or many populations or occurrences, but with some cause for concern as a result of recent local declines, threats, or other factors.
N5	Secure	At very low or no risk of extirpation due to a very extensive range, abundant populations or occurrences, with few concerning declines or threats.
NU	Unrankable	Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
NNR	Not ranked	National conservation status not yet assessed.
NNA	Not applicable	A conservation status rank is not applicable because the species is not a suitable target for conservation activities. This category includes exotic species (which have been moved beyond their natural range as a result of human activity), hybrids, or long distance migrants (accidental species occurring infrequently and unpredictably outside their usual range).

Source: Canadian Endangered Species Conservation Council (2016).

Status of wild species indicators

The main indicator summarizes the national extinction risk level of the Canadian species assessed in 2015. The status of species in 34 taxonomic groups was assessed in 2015: selected macrofungi, macrolichens, bryophytes, vascular plants, sponges, corals, freshwater bivalves, non-marine snails and slugs, spiders, mayflies, dragonflies and damselflies, stoneflies, grasshoppers and relatives, lacewings, beetles, ants, bees, yellowjacket wasps, caddisflies, moths and butterflies, scorpionflies, black flies, mosquitoes, horse flies, bee flies, flower flies, decapods, sea cucumbers, sea urchins, fishes, amphibians, reptiles, birds, and mammals. The main indicator is the proportion of assessed species in each of the ranks NX, NH, and N1 through N5.

A companion indicator reports the status by taxonomic group. In addition to the extinction risk level, the categories Unrankable and Not ranked were included to show differences in the level of knowledge available for the different groups.

Exotic species indicator

Exotic species are identified in Wild Species 2015 and included in the Not applicable category. The indicator compares the number of native and exotic species in 3 broad taxonomic groups. Native species are defined as all species given a rank other than Not applicable.

For more information on methodology, please consult the Wild Species report series.

Recent changes

Previous indicators based on the Wild Species report series used a different ranking system. The indicators have been updated to reflect the new system. The Exotic species indicator has been added to provide information on the types of species that are most likely to have been introduced to Canada.

The previous indicators included a breakdown by province and territory, which has been replaced by increased information on species groups. Please consult the Wild Species 2015 report for regional reporting.

Caveats and limitations

The number of species assessed in the Wild Species report series has increased from 1 670 in 2000 to 29 848 in 2015. However, there are still many species left to assess; the vast majority of them are insects and other invertebrates.

Conservation ranks consider only the risk of extirpation from Canada. In some cases, large changes in population size or distribution may not trigger a change in rank.

Resources

References

Canadian Endangered Species Conservation Council (2001) Wild Species 2000: The General Status of Species in Canada. Minister of Public Works and Government Services Canada. Retrieved on April 30, 2018.

Canadian Endangered Species Conservation Council (2006) Wild Species 2005: The General Status of Species in Canada. National General Status Working Group. Retrieved on April 30, 2018.

Canadian Endangered Species Conservation Council (2011) Wild Species 2010: The General Status of Species in Canada. National General Status Working Group. Retrieved on April 30, 2018.

Canadian Endangered Species Conservation Council (2016) Wild Species 2015: The General Status of Species in Canada. National General Status Working Group. Retrieved on April 30, 2018.

Related information

Canada's Species at Risk Public Registry

Committee on the Status of Endangered Wildlife in Canada

Habitat stewardship for species at risk

Canadian Biodiversity Strategy

2020 Biodiversity Goals and Targets for Canada

The IUCN Red List of Threatened Species

Annex

Annex A. Data tables for the figures presented in this document

Table A.1. Data for Figure 1. National conservation status of native wild species, Canada, 2015

Status name	Status code	Percentage of species	Number of species
National extinction risk rank	-	-	-
Presumed extirpated	NX	0.3	45
Possibly extirpated	NH	0.5	80
Critically imperiled	N1	4.5	718
Imperiled	N2	5.1	816
Vulnerable	N3	9.9	1 586
Apparently secure	N4	30.1	4 846
Secure	N5	49.7	7 987
Subtotal national extinction risk ranks	-	**100**	**16 078**
Unrankable (insufficient information)	NU	-	8 026
Not ranked (not yet assessed)	NNR	-	2 661
Not applicable (species is not a conservation target)[A]	NNA	-	3 083
Total	-	-	**29 848**

Note: [A] Non-native species are included in the Not applicable category. They are also known as "exotic" or "alien" species. Species that only occur rarely in Canada, sometimes called "accidentals" or "vagrants," and hybrids are also included in the category. The ranking system developed by NatureServe, an international network of over 80 conservation data centers, is used.
Source: Canadian Endangered Species Conservation Council (2016) Wild Species 2015: The General Status of Species in Canada, National General Status Working Group.

Table A.2. Data for Figure 2. Status of native species in selected groups, Canada, 2015

Species group	Presumed extirpated (NX)	Possibly extirpated (NH)	Critically imperiled (N1)	Imperiled (N2)	Vulnerable (N3)	Apparently secure (N4)	Secure (N5)	Subtotal of species with assigned extinction risk levels	Unrankable (NU)	Not ranked (NNR)	Total target species	Percentage of target species with assigned risk levels	Non-target species[A] (NNA)
Amphibians	1	0	2	5	9	12	18	**47**	0	0	**47**	100	1
Ants	0	2	0	0	5	18	119	**144**	45	8	**197**	73	15
Bee flies	0	1	9	6	16	24	9	**65**	47	1	**113**	58	3
Bees	0	0	4	30	76	88	240	**438**	347	2	**787**	56	18
Beetles	0	22	78	53	156	1 423	1 981	**3 713**	3 608	16	**7 337**	51	626
Birds	4	0	26	14	48	71	276	**439**	16	1	**456**	96	222
Black flies	0	0	1	4	15	47	51	**118**	42	0	**160**	74	0
Bryophytes	2	1	75	85	134	249	403	**949**	378	20	**1 347**	70	28
Caddisflies	0	0	0	1	1	107	109	**218**	428	42	**688**	32	0
Corals	0	0	0	0	38	5	14	**57**	132	1	**190**	30	0
Decapods	0	0	0	0	9	9	128	**146**	145	3	**294**	50	22
Dragonflies and damselflies	0	1	11	15	26	30	118	**201**	3	1	**205**	98	8
Fishes	3	1	9	25	54	53	381	**526**	521	0	**1 047**	50	332
Flower flies	0	0	4	15	44	140	122	**325**	184	5	**514**	63	10
Freshwater bivalves	1	1	13	9	11	15	35	**85**	0	1	**86**	99	7
Grasshoppers and relatives	1	8	12	12	19	42	125	**219**	14	0	**233**	94	36
Horse flies	0	1	4	7	7	45	58	**122**	22	0	**144**	85	0
Lacewings	0	0	0	2	2	14	4	**22**	55	18	**95**	23	6

Species group	Presumed extirpated (NX)	Possibly extirpated (NH)	Critically imperiled (N1)	Imperiled (N2)	Vulnerable (N3)	Apparently secure (N4)	Secure (N5)	Subtotal of species with assigned extinction risk levels	Unrankable (NU)	Not ranked (NNR)	Total target species	Percentage of target species with assigned risk levels	Non-target species[A] (NNA)
Macrolichens	0	11	70	51	63	164	313	**672**	180	1	**853**	79	4
Mammals	1	1	11	10	31	24	112	**190**	8	0	**198**	96	24
Mayflies	0	0	1	2	2	52	19	**76**	250	16	**342**	22	0
Mosquitoes	0	0	0	0	1	8	56	**65**	12	0	**77**	84	3
Moths and butterflies	1	2	33	56	244	738	904	**1 978**	541	2 474	**4 993**	40	264
Non-marine snails and slugs	1	4	15	25	24	52	63	**184**	89	6	**279**	66	47
Reptiles	4	0	5	6	15	5	9	**44**	2	0	**46**	96	3
Scorpionflies	0	0	1	2	2	11	1	**17**	8	0	**25**	68	0
Sea cucumbers	0	0	0	0	0	0	44	**44**	27	2	**73**	60	2
Sea urchins	0	0	0	0	1	0	21	**22**	15	1	**38**	58	0
Selected macrofungi	0	0	0	0	0	18	5	**23**	51	13	**87**	26	0
Spiders	0	0	7	37	49	310	465	**868**	458	2	**1 328**	65	71
Sponges	0	0	0	0	3	0	30	**33**	177	2	**212**	16	0
Stoneflies	0	0	0	0	0	57	43	**100**	169	24	**293**	34	0
Vascular plants	26	24	315	325	467	1 005	1 684	**3 846**	46	1	**3 893**	99	1 318
Yellowjacket wasps	0	0	12	19	14	10	27	**82**	6	0	**88**	93	13

Note: [A] Species in the Not applicable category have been determined not to be conservation targets. These include, for example, non-native species and species that occur only occasionally in Canada. The status name is followed by the NatureServe code in parentheses. Categories from Presumed extirpated (NX) through Secure (N5) are related to the

risk of species loss and are considered "extinction risk levels." Categories Unrankable and Not ranked include species for which the risk of loss is unknown. Categories from Presumed extirpated (NX) through Not ranked (NNR) contain species that are potential targets of conservation efforts: the number of target species in the table is the sum of these categories.
Source: Canadian Endangered Species Conservation Council (2016) Wild Species 2015: The General Status of Species in Canada, National General Status Working Group.

Table A.3. Data for Figure 3. Native and exotic species in selected groups, Canada, 2015

Group	Native species	Exotic species
Vertebrates	1 794	39
Vascular plants	3 893	1 315
Assessed insects	16 291	902

Note: Native and exotic species (24 234 species) are considered. Other species that are not subject to conservation efforts, such as hybrids and species that occur only occasionally in Canada, are excluded. All species of vascular plants and vertebrates have been assessed but not all insects.
Source: Canadian Endangered Species Conservation Council (2016) Wild Species 2015: The General Status of Species in Canada, National General Status Working Group.

Additional information can be obtained at:

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